

REMARKS

In the Office Action, the Examiner noted that claims 1-13 are pending in the application, and that claims 1-13 are rejected. Responsive to a rejection in Paragraph 2 of the Office Action, the Applicant amended claim 3 to correct a typographical error.

In view of the above amendment and the following discussion, the Applicant submits that none of the claims now pending in the application are anticipated under the provisions of 35 U.S.C. § 102. Furthermore, the Applicant submits that all of these claims now satisfy the requirements of 35 U.S.C. § 112. Thus, the Applicant believes that all of these claims are now in allowable form.

I. REJECTION OF CLAIMS 3-5 UNDER 35 U.S.C. § 112

The Examiner rejected claims 3-5 in Paragraph 2 of the Office Action as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Examiner noted that the term "demposition" rendered claim 3 as vague and indefinite, and that claims 4-5 are rejected as being dependent upon the rejected base claim. Responsive to the rejection, the Applicant has amended "demposition" to "decomposition" to correct a typographical error. Therefore, the Applicant respectfully requests the withdrawal of the rejection.

II. REJECTION OF CLAIMS 1-13 UNDER 35 U.S.C. § 102

A. Claims 1 and 7

The Examiner rejected claims 1 and 7 in Paragraph 4 of the Office Action as being unpatentable over Shapiro (U.S. patent 5,563,960, issued October 8, 1996). The rejection is respectfully traversed.

Shapiro teaches a method and apparatus for emphasizing a selected portion of an image during a coding process. Specifically, Shapiro allocates more bits to a selected region of an image at the expense of other regions of the image

(See Shapiro, Abstract). Once bit allocation is performed on the image, Shapiro codes the image using conventional subband decomposition and creates a bitstream comprising header bits and data bits representative of the image (See Shapiro, Figure 1, and column 3, lines 46-50).

However, Shapiro fails to teach or suggest a payload having at least one texture unit consisting only of AC coefficients from a single subband of a heirarchical subband decomposed image. Specifically, Applicant's claims 1 and 7 positively recite:

1. A data structure stored on a computer readable medium comprising:
 a packet header; and
 a payload having at least one texture unit consisting only of AC coefficients from a single subband of a hierarchical subband decomposed image. (emphasis added)

7. A method for packetizing a hierarchical subband decomposed image having a plurality of decomposition levels, said method comprising the steps of:
 (a) generating a packet header; and
 (b) generating a payload having at least one texture unit consisting only of AC coefficients from a single subband of the hierarchical subband decomposed image. (emphasis added)

Applicant's invention teaches a method and apparatus for packetizing a data structure that improves error resilience when applied to the coding of hierarchical subband decomposed coefficients. Namely, if an error occurs in a packet or a portion thereof, the overall amount of information that is lost is minimized. In one embodiment, Applicant's invention generates a data structure having a packet header and a payload having at least one text unit consisting of only of AC coefficients from a single subband of the hierarchical subband decomposed image.

In contrast, the section cited by the Examiner (Shapiro, Figure 3 and column 4, lines 1-28) is directed to a standard wavelet hierarchical subband decomposition of an image. In this wavelet decomposition, an image is initially decomposed using times two subsampling into four frequency subbands. The low vertical, low horizontal (LL) subband is then further subsampled to produce

another set of four subbands. However, the cited section is totally devoid of any teaching or suggestion of how these subbands should be packetized. In fact, the Examiner appears to simply point to Figures 1-2 that show item 40 as being data bits behind header bits. Thus, at best, the Examiner is reiterating the standard packetizing method where no distinction is made as to how different subband coefficients are to be packetized. Thus, without any teaching as to specific packetizing methods, Shapiro then further fails to teach a texture unit consisting only of AC coefficients from a single subband of the hierarchical subband decomposed image. Therefore, the Applicant respectfully submits that claims 1 and 7 fully satisfy the requirements of 35 U.S.C. § 102 and are patentable thereunder.

B. Claims 2 and 8

The Examiner rejected claims 2 and 8 in Paragraph 4 of the Office Action as being unpatentable over Shapiro. The rejection is respectfully traversed. Shapiro also fails to teach or suggest a payload having at least one texture unit consisting only of AC coefficients from all subbands of a decomposition level of a hierarchical subband decomposed image. Specifically, the Applicant's claims 2 and 8 positively recite:

2. A data structure stored on a computer readable medium comprising:
 a packet header; and
 a payload having at least one texture unit consisting only of AC coefficients from all subbands of a decomposition level of a hierarchical subband decomposed image. (emphasis added)

8. A method for packetizing a hierarchical subband decomposed image having a plurality of decomposition levels, said method comprising the steps of:
 (a) generating a packet header; and
 (b) generating a payload having at least one texture unit consisting only of AC coefficients from all subbands of a decomposition level of the hierarchical subband decomposed image. (emphasis added)

The Examiner also cited to Figure 3 and column 4, lines 1-28 of Shapiro as teaching a payload "having at least one texture unit only of AC coefficients from

all subbands of a decomposition level of the hierarchical subband decomposed image." The Applicant respectfully disagrees.

As discussed above in Section II.A, the cited section is totally devoid of any teaching or suggestion of a packet having a texture unit consisting only of AC coefficients. Thus, the cited section cannot teach or suggest a texture unit consisting only of AC coefficients from all subbands of a decomposition level of the hierarchical subband decomposed image as in claims 2 and 8 of Applicant's invention. Therefore, the Applicant respectfully submits that claims 2 and 8 fully satisfy the requirements of 35 U.S.C. § 102 and are patentable thereunder.

C. Claims 3-5 and 9-11

The Examiner rejected claims 3-5 and 9-11 in Paragraph 4 of the Office Action as being unpatentable over Shapiro. The rejection is respectfully traversed.

Shapiro also fails to teach or suggest a payload having a texture unit consisting only of AC coefficients across n subbands, where n represents a number smaller than a number of decomposition levels of a hierarchical subband decomposed image. Specifically, the Applicant's claims 3 and 9 positively recite:

3. A data structure stored on a computer readable medium comprising:
 a packet header; and
 a payload having a texture unit consisting only of AC coefficients across n subbands, where n represents a number smaller than a number of decomposition levels of a hierarchical subband decomposed image.
 (emphasis added)

9. A method for packetizing a hierarchical subband decomposed image having a plurality of decomposition levels, said method comprising the steps of:
 (a) generating a packet header; and
 (b) generating a payload having a texture unit consisting only of AC coefficients across n subbands, where n represents a number smaller than a number of the decomposition levels of the hierarchical subband decomposed image. (emphasis added)

The Examiner cited to Figures 3-5 and column 4, lines 1-28 of Shapiro as teaching a payload "having a texture unit consisting only of AC coefficients across

n subbands, where n represents a number smaller than a number of the decomposition levels of the hierarchical subband decomposed image." The Applicant respectfully disagrees.

As discussed above in Sections II.A, and II.B, Figure 3 and column 4, lines 1-28 of Shapiro is totally devoid of any teaching or suggestion of a packet having a texture unit consisting only of AC coefficients. Figure 4 is directed to a parent-child relationship of an image decomposed to three scales. Figure 5 teaches an encoder having a filter means for performing standard hierarchical decomposition. Thus, Figures 4 and 5 also fail to teach or suggest a packet having a texture unit consisting only of AC coefficients.

Thus, the cited sections fail to teach or suggest a texture unit consisting only of AC coefficients from n subbands, where n represents a number smaller than a number of the decomposition levels of the hierarchical subband decomposed image as in claims 3 and 9 of Applicant's invention. Therefore, the Applicant respectfully submits that claims 3 and 9 fully satisfy the requirements of 35 U.S.C. § 102 and are patentable thereunder.

Furthermore, claims 4-5 and 10-11 depend directly from claims 3 and 9 respectively, and recite additional features therefor. As Shapiro fails to teach Applicant's invention, as recited in claims 3 and 9, dependent claims 4-5 and 10-11 also fully satisfy the requirements of 35 U.S.C. § 102 and are patentable thereunder.

D. Claims 6 and 12

The Examiner also rejected claims 6 and 12 in Paragraph 4 of the Office Action as being unpatentable over Shapiro. The rejection is respectfully traversed.

Shapiro also fails to teach or suggest a payload having a texture unit comprising bits from a plurality of DC transform coefficients that form a single bitplane. Specifically, the Applicant's claims 6 and 12 positively recite:

6. A data structure stored on a computer readable medium comprising:
a packet header; and

a payload having a texture unit comprising bits from a plurality of DC transform coefficients that form a single bitplane. (emphasis added)

12. A method for packetizing a hierarchical subband decomposed image having a plurality of decomposition levels, said method comprising the steps of:

(a) generating a packet header; and

(b) generating a payload having a texture unit comprising bits from a plurality of DC transform coefficients that form a single bitplane. (emphasis added)

The Examiner also cited to Figures 3-5 and column 4, lines 1-28 of Shapiro as teaching a payload "having a texture unit comprising bits from a plurality of DC transform coefficients that form a single bitplane." The Applicant respectfully disagrees.

As discussed above in Section II.A., the cited section in Shapiro is directed to a standard wavelet hierarchical subband decomposition of an image. However, the cited section is also devoid of any teaching or suggestion of a packet having texture unit comprising bits from a plurality of DC transform coefficients that form a single bitplane. The important aspect of Applicant's invention is the specific manner of packetization of the subband coefficients to effect error resilience. Thus, Applicant's claims are not so broad as to read on the standard subband decomposition method. Therefore, the Applicant respectfully submits that claims 6 and 12 fully satisfy the requirements of 35 U.S.C. § 102 and are patentable thereunder.

E. Claim 13

The Examiner also rejected claim 13 in Paragraph 4 of the Office Action as being unpatentable over Shapiro. The rejection is respectfully traversed. Shapiro also fails to teach or suggest a payload carrying coefficients, where said payload has a payload size that varies in accordance with coefficients from a subband or decomposition level of said hierarchical subband decomposed image. Specifically, the Applicant's claim 13 positively recites:

13. A method for packetizing a hierarchical subband decomposed image having a plurality of decomposition levels, said method comprising the steps of:

(a) generating a packet header; and

(b) generating a payload for carrying coefficients, where said payload has a payload size that varies in accordance with coefficients from a subband or decomposition level of said hierarchical subband decomposed image. (emphasis added)

The Examiner also cited to Figures 3-5 and column 4, lines 1-28 of Shapiro as teaching a payload for carrying coefficients "where said payload has a payload size that varies in accordance with coefficients from a subband or decomposition level of said hierarchical subband decomposed image." The Applicant respectfully disagrees.

As discussed above in Section II.A., the cited section is directed to a standard wavelet hierarchical subband decomposition of an image. However, the cited section is devoid of any teaching or suggestion of a packet having a variable payload size, much less a payload size that varies with coefficients from a subband or decomposition level of a hierarchical subband decomposed image. Therefore, the Applicant respectfully submits that claim 13 fully satisfies the requirements of 35 U.S.C. § 102 and is patentable thereunder.

Conclusion

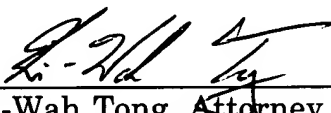
Thus, the Applicant submits that all of these claims now fully satisfy the requirements of 35 U.S.C. §102. Furthermore, the applicant also submits that all of these claims now fully satisfy the requirements of 35 U.S.C. § 112. Consequently, the Applicant believes that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring the issuance of an adverse final action in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. Kin-Wah Tong,

Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,


10/5/00


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